



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,552	02/08/2006	Richard Harding	MERCK-3144	9249
23599 7590 07/22/2010 MILLEN, WHITE, ZELANO & BRANIGAN, P.C. 2200 CLARENDON BLVD. SUITE 1400 ARLINGTON, VA 22201			EXAMINER HON, SOW FUN	
			ART UNIT 1783	PAPER NUMBER
			NOTIFICATION DATE 07/22/2010	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@mwzb.com

Office Action Summary	Application No. 10/567,552	Applicant(s) HARDING ET AL.	
	Examiner SOPHIE HON	Art Unit 1783	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 4/26/10.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 17-41 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 39 is/are allowed.
- 6) ☒ Claim(s) 1-11, 14, 15, 17-28, 31-38, 40 and 41 is/are rejected.
- 7) ☒ Claim(s) 12, 13, 29 and 30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Withdrawn Objection

1. The objection to claim 40 is withdrawn due to Applicant's amendment dated 04/26/10.

Response to Arguments

Withdrawn Rejections

2. The 35 U.S.C. 103(a) rejections of claims 1-9, 14-15, 17-28, 31-38, 40 over Gass as the primary reference, are withdrawn due to Applicant's arguments dated 04/26/10.
3. The 35 U.S.C. 103(a) rejection of claims 10-11 over Ichimura in view of Gass as the primary reference, is withdrawn due to Applicant's arguments dated 04/26/10.

New Rejections

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

4. Claims 1, 3-5, 8, 17-21, 27-28, 31, 33-35, 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Ito (US 2002/0145691).

Regarding claims 1, 3, 28, 31, Ito teaches an alignment layer for aligning liquid crystal molecules, said alignment layer comprising (a) a polymer film formed from a

Art Unit: 1794

polymer ([0196]). Ito teaches that a solution of reactive mesogen in monomeric form is coated onto the polymer film of the alignment layer after preparation of said alignment layer ([0298]) where (b) at least one of the reactive mesogen in monomeric form is expected to infiltrate the polymer layer, the solvent being a carrier, and thus be present within the polymer film of the alignment layer after preparation of said alignment layer. As such, the alignment layer contains unreacted polymerizable groups in said at least one reactive mesogen which is not said polymer used to form said polymer film of said alignment layer. The amount of infiltrated reactive mesogen monomer is not expected to be large since the infiltration time is short (2 minutes, [0298]), and thus corresponds to a small amount relative to the bulk of the polymer film, which is characteristic of an additive.

Regarding claim 4, although Ito fails to teach that the alignment layer is obtainable from a precursor material comprising at least one reactive mesogen, and even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See MPEP 2113. In the instant case, Ito teaches the alignment layer comprising (a) polymer film formed from a polymer and (b) at least one reactive mesogen additive in monomeric form within said polymer film, as described above.

Regarding claim 5, Ito teaches that the alignment layer is a solvent processed film wherein said alignment layer is formed from a solution of said polymer ([0208]).

Regarding claim 6, Ito teaches that the polymer film can be a solvent processed polyimide film ([0197]). Although Ito fails to teach that the alignment layer is obtained from a precursor solution of polyimide precursor and said at least one reactive mesogen, and even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See MPEP 2113. In the instant case, Ito teaches the alignment layer comprising (a) a polyimide film and (b) at least one reactive mesogen additive in monomeric form within said polyimide film, as described above.

Regarding claim 8, Ito teaches that the alignment layer can be a solvent processed ([0208]) cellulose based film ([0197]).

Regarding claim 17, Ito teaches a laminate comprising the alignment layer and a film comprising a polymerized or crosslinked liquid crystal material ([0298]).

Regarding claim 18, Ito teaches a method of preparing a laminate, said method comprising providing a layer of polymerizable liquid crystal material onto an alignment layer, aligning the liquid crystal material into uniform orientation, and polymerizing or crosslinking the liquid crystal material ([0298]).

Regarding claims 19-21, Ito teaches a liquid crystal display device, which is an electro-optical device, comprising the alignment layer ([0312]).

Regarding claim 27, although Ito fails to teach that the alignment layer is obtained from a polymer precursor or polymer precursor solution to which said at least one reactive mesogen is added before processing or polymerizing of the polymer precursor, and even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See MPEP 2113. In the instant case, Ito teaches the alignment layer comprising (a) a polymer film formed from a polymer and (b) at least one reactive mesogen additive in monomeric form within said polymer film, as described above, where said at least one reactive mesogen is physically trapped within said polymer in that it is trapped within the polymer matrix upon evaporation of the solvent carrier after solvent-processing as described above.

Regarding claim 33, although Ito fails to teach that the alignment layer is obtainable from a precursor material comprising said at least one reactive mesogen and material for forming said polymer film, and even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious

Art Unit: 1794

from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See MPEP 2113. In the instant case, Ito teaches the alignment layer comprising (a) a polymer film formed from a polymer and (b) at least one reactive mesogen additive in monomeric form within said polymer film, as described above.

Regarding claim 34, although Ito fails to teach that said alignment layer is obtained by applying to a substrate a precursor material comprising a solution of the polymer used to form said polymer film, wherein said solution further contains said at least one reactive mesogen, where the solution is then heated to remove excess solvent, and even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See MPEP 2113. In the instant case, Ito teaches the alignment layer comprising (a) a polymer film formed from a polymer and (b) at least one reactive mesogen additive in monomeric form within said polymer film, as described above.

Regarding claim 35, although Ito fails to teach that the alignment layer is obtained by applying to a substrate a precursor material comprising said at least one reactive mesogen and a polymer precursor for forming said polymer film, and then subjecting the precursor material to polymerization, and even though product by process claims are limited by and defined by the process, determination of patentability

Art Unit: 1794

is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See MPEP 2113. In the instant case, Ito teaches the alignment layer comprising (a) a polymer film formed from a polymer and (b) at least one reactive mesogen additive in monomeric form within said polymer film, as described above.

Regarding claim 38, Ito teaches an alignment layer for aligning liquid crystal molecules, said alignment layer comprising (a) a polymer film formed from a polymer ([0196]). Ito teaches that a solution of reactive mesogen in monomeric form is coated onto the polymer film of the alignment layer after preparation of said alignment layer ([0298]) where (b) at least one of the reactive mesogen in monomeric form is expected to infiltrate the polymer layer, the solvent being a carrier, and thus be present within the polymer film of the alignment layer after preparation of said alignment layer. As such, the alignment layer contains unreacted polymerizable groups in said at least one reactive mesogen. The amount of infiltrated reactive mesogen is not expected to be large since the infiltration time is short (2 minutes, [0298]), and thus corresponds to a small amount relative to the bulk of the polymer film, which is characteristic of an additive.

Art Unit: 1794

5. Claim 15 is rejected under 35 U.S.C. 102(b) as being anticipated by Coates (US 6,042,745).

Coates teaches a polymer precursor composition comprising at least one reactive mesogen additive and a polymer or a precursor of said polymer (column 7, lines 12-20, polymer, column 7, lines 35-50). Although Coates fails to teach that the polymer precursor composition is for preparing an alignment layer, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In the instant case, Coates teaches the presently claimed polymer precursor composition.

Claim Rejections - 35 USC § 103

6. Claims 2, 14, 22-24, 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito as applied to claims 1, 3-5, 8, 17-21, 27-28, 31, 33-35, 38 above.

Ito teaches the alignment layer comprising (a) a polymer film formed from a polymer and (b) at least one reactive mesogen additive in monomeric form within said polymer film, as described above.

Regarding claims, 2, 22-24, the amount of infiltrated reactive mesogen is not expected to be large since Ito teaches that the infiltration time is short (2 minutes, [0298]), and thus corresponds to a small amount relative to the bulk of the polymer film, which is characteristic of an additive, a common amount being one that is within a range

Art Unit: 1794

of less than 5% by weight, which is within the claimed range of less than 50%, or less than 20% or less than 10%.

Regarding claim 14, the amount of infiltrated reactive mesogen is not expected to be large since Ito teaches that the infiltration time is short (2 minutes, [0298]), and thus corresponds to a small amount relative to the bulk of the polymer film, which is characteristic of an additive, a common amount being one that is within a range of less than 5% by weight which contains the claimed range of 0.5 to 4%.

Regarding claim 32, the amount of infiltrated reactive mesogen is not expected to be large since Ito teaches that the infiltration time is short (2 minutes, [0298]), and thus corresponds to a small amount relative to the bulk of the polymer film, which is characteristic of an additive, a common amount being one that is within a range of less than 5% by weight which contains the claimed range of 1 to 2%.

Although Ito fails to teach that the alignment layer is obtainable from a precursor material that comprises 1 to 2% of said at least one reactive mesogen, and even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See MPEP 2113. In the instant case, Ito teaches the alignment layer comprising (a) polymer film formed from a polymer and (b) at least one reactive mesogen additive in monomeric form within said polymer film, as described above.

Art Unit: 1794

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito as applied to claims 1, 3-5, 8, 17-21, 27-28, 31, 33-35, 38 above, and further in view of Tsuboyama (US 5,099,344).

Ito teaches the alignment layer comprising (a) a polymer film formed from a polymer and (b) at least one reactive mesogen additive in monomeric form within said polymer film, as described above. In addition, Ito teaches that the polymer film can be a polyimide film ([0197]), but is silent regarding the specifics of the polyimide film.

However, Tsuboyama teaches an alignment layer that comprises a polyimide film (column 4, lines 7-15) that has repeating units of formula A of Applicant (column 55, lines 35-50) for the purpose of providing the desired alignment characteristics.

Therefore, since Ito is silent regarding the specifics of the polyimide film, it would have been necessary and hence obvious to have looked to the prior art for a suitable one. As such, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided a polyimide that has repeating units of formula A of Applicant, as a polyimide in the polyimide film of Ito, in order to obtain the desired alignment characteristics, as taught by Tsuboyama.

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito as applied to claims 1, 3-5, 8, 17-21, 27-28, 31, 33-35, 38 above, and further in view of Takiguchi (US 4,984,873).

Ito teaches the alignment layer that is a solvent processed cellulose-based film, as discussed above. In addition, Ito teaches that the cellulose-based film can be a

Art Unit: 1794

cellulose ester film ([0197]), but fails to further specify that it can be a triacetate cellulose film.

However, a triacetate cellulose film is a common species of a cellulose ester film that is used for an alignment layer, as evidenced by Takiguchi.

Takiguchi teaches an alignment layer that is a triacetate cellulose film (triacyl cellulose film ... is applied with horizontal alignment treatment, column 12, lines 1-10), used for the purpose of providing the desired alignment properties.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided a triacetate cellulose film as the solvent processed cellulose ester film of the alignment layer of Ito, in order to obtain the desired alignment properties, as taught by Takiguchi.

9. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito (US 2002/0145691) in view of Ichimura (US 6,001,277).

Ito teaches an alignment layer for aligning liquid crystal molecules, said alignment layer comprising (a) a layer ([0196]). Ito teaches that a solution of reactive mesogen in monomeric form is coated onto the alignment layer after preparation of said alignment layer ([0298]) where (b) at least one of the reactive mesogen in monomeric form, is expected to infiltrate the polymer layer, the solvent being a carrier, and thus be present within the alignment layer after preparation of said alignment layer. Ito teaches that the reactive mesogen contains unreacted polymerizable groups ([0300]). The amount of infiltrated reactive mesogen is not expected to be large since the infiltration time is short (2 minutes, [0298]), and thus corresponds to a small amount relative to the

Art Unit: 1794

bulk of the alignment layer, which is characteristic of an additive. Ito fails to teach that the (a) layer is a command layer comprising an isomerizable azobenzene compound.

However, Ichimura teaches an alignment layer for aligning liquid crystal molecules, where the alignment layer comprises an isomerisable azobenzene compound introduced by a polymeric precursor material comprising at least one reactive mesogen (4-(2-methacryloyloxyethoxy)azobenzene, column 36, lines 60-65, polymer, column 36, lines 1-5), for the purpose of making said alignment layer (a) a command layer wherein changes in the orientational direction of the azobenzene induce a specific alignment of an LC material coated onto said alignment layer, for the purpose of providing the desired alignment switching characteristics.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided (a) a command layer comprising an isomerizable azobenzene compound, wherein changes in the orientational direction of the azobenzene induce a specific alignment of an LC material coated onto said alignment layer, as the (a) layer of the alignment layer of Ito, in order to obtain the desired alignment switching characteristics, as taught by Ichimura.

10. Claims 25-26, 36-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito as applied to claims 1-5, 8, 14, 17-24, 27-28, 31-35, 38 above, and further in view of Komatsu (US 5,989,758).

Ito teaches (a) a polymer film formed from a polymer and (b) at least one reactive mesogen additive within said polymer film, wherein the least one reactive mesogen is not said polymer used to form said polymer film, and wherein after preparation of said

Art Unit: 1794

alignment layer, said alignment layer contains unreacted polymerizable groups in said at least one reactive mesogen additive, as described above. Ito is silent regarding the birefringence of the alignment layer before and after addition of said at least one reactive mesogen.

However, Komatsu teaches that an alignment layer can be optically isotropic (orientation substrate, column 24, lines 14-20) which means that the alignment layer has a birefringence that is ideally zero, which is within the claimed range of less than 0.05, or less than 0.01, or less than 0.005, for the purpose of providing minimal optical interference. Komatsu teaches alignment layers that are non-mesogenic (column 22, lines 9-15) which are more likely to be isotropic.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have made the alignment layer of Ito, non-mesogenic, and to have provided it with a birefringence that is within a range of less than 0.05, or less than 0.005, where the birefringence of the alignment layer before addition of said at least one reactive mesogen has a birefringence of less than 0.01, in order to minimize any optical interference, as taught by Komatsu.

11. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito (US 2002/0145691) as evidenced by Lacker (US 4,944,576).

Ito teaches an alignment layer for aligning liquid crystal molecules, said alignment layer comprising (a) a polymer film formed from a polymer ([0196]). Ito teaches that a solution of reactive mesogen in monomeric form is coated onto the polymer film of the alignment layer after preparation of said alignment layer ([0298])

Art Unit: 1794

where (b) at least one of the reactive mesogen in monomeric form is expected to infiltrate the polymer layer, the solvent being a carrier, and thus be present within the polymer film of the alignment layer after preparation of said alignment layer which is after polymerization to form the polymer of the polymer layer. Ito teaches that the reactive mesogen contains unreacted polymerizable groups ([0300]). The amount of infiltrated reactive mesogen is not expected to be large since the infiltration time is short (2 minutes, [0298]), and thus corresponds to a small amount relative to the bulk of the polymer film, which is characteristic of an additive. The reactive mesogen in monomeric form inherently functions as a plasticizer to improve the processibility of the polymer of the polymer film, as evidenced by Lacker.

Lacker teaches that a mesogen compound inherently functions as a plasticizer to improve the processibility of the polymer matrix (liquid crystal, fraction is retained in the polymer as isotropic plasticizers, column 5, lines 40-45).

12. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito (US 2002/0145691).

Ito teaches an alignment layer for aligning liquid crystal molecules, said alignment layer comprising (a) a polymer film formed from a polymer ([0196]). Ito teaches that a solution of reactive mesogen in monomeric form is coated onto the polymer film of the alignment layer after preparation of said alignment layer ([0298]) where (b) at least one of the reactive mesogen in monomeric form is expected to infiltrate the polymer layer, the solvent being a carrier, and thus be present within the polymer film of the alignment layer after preparation of said alignment layer. As such,

Art Unit: 1794

the alignment layer contains unreacted polymerizable groups in said at least one reactive mesogen which is not said polymer used to form said polymer film of said alignment layer. The amount of infiltrated reactive mesogen is not expected to be large since the infiltration time is short (2 minutes, [0298]), and thus corresponds to an small amount relative to the bulk of the polymer film, which is characteristic of an additive, a common amount being one that is within a range of less than 5% by weight.

Allowable Subject Matter

13. Claim 39 is allowed.
14. Claims 12-13, 29-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

15. Applicant's arguments regarding claims 1-11, 14-15, 17-28, 31-38, 40 have been considered but are moot in view of the new ground(s) of rejection.

Art Unit: 1794

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample, can be reached on (571)272-1376. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sophie Hon/

Sow-Fun Hon

Primary Examiner, Art Unit 1783

Application/Control Number: 10/567,552
Art Unit: 1794

Page 17